

1. A signal processing method for improving the signal to noise ratio in ultrasonic measurements, the method comprising transmission of a predefined timed sequence of a number of ultrasonic burst signals at a first transducer, wherein the time periods between subsequently transmitted burst signals of said sequence are set according to a non-uniform pattern, wherein at least one time period differs from an other time period, and reception of a signal representing said transmitted sequence of ultrasonic burst signals at a second transducer, addition of multiple time-shifted copies of the received signal to said original received signal to obtain a sum of the original received signal and its time-shifted copies , wherein the time shift of a copy is related to said predefined pattern, and reconstruction of an original burst signal having an improved signal to noise ratio from said sum.  
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- 15 2. A signal processing method according to claim 1, characterised in that all time periods between subsequently transmitted signals of said sequence are different.
- 20 3. A signal processing method according to claim 1 or 2, characterised in that the number of copies is equal to the number of burst signals in said sequence minus one.
- 25 4. A signal processing method according to one of the preceding claims, characterised in that the time shifts are proportional to said time periods.
- 30 5. A signal processing method according to one of the preceding claims, characterised in that a single burst signal is reconstructed.
6. A signal processing method according to one of the preceding claims, characterised in that the shape of an original burst signal is reconstructed.

7. A signal processing method according to one of the preceding claims, characterised in that the travel time of the reconstructed original burst signal is determined.

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8. A method of determining a flow characteristic of a fluid in a conduit using an ultrasonic measurement device, comprising transmitting a predefined timed sequence of a number of ultrasonic burst signals at a first transducer, such that the time periods between subsequently transmitted burst signals of said sequence are set according to a non-uniform pattern, and receiving a signal representing said sequence of ultrasonic burst signals at a second transducer, adding multiple time-shifted copies of the received signal to obtain a sum of the original received signal and its time-shifted copies, wherein the time shifts are related to said predefined pattern, reconstructing an original burst signal, determining the travel time of said reconstructed original burst signal, and calculating the flow characteristic using said travel time.

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9. A method according to claim 8, characterised in that all time periods between the subsequently transmitted signals of said sequence are different.

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10. A method according to claim 8 or 9, characterised in that the number of copies is equal to the number of burst signals in said sequence minus one.

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11. A method according to one of the preceding claims 8-10, characterised in that the time shifts are proportional to said time periods.

12. A method according to one of the preceding claims 8-11, characterised in that a single burst signal is reconstructed.

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13. A method according to one of the preceding claims 8-12, characterised in that the shape of an original burst signal is reconstructed.

5 14. A method according to one of the preceding claims 8-13, characterised in that a zero crossing from said reconstructed burst signal is defined as a reference for determining the travel time of said reconstructed burst signal.

10 15. A method according to one of the preceding claims 8-14, characterised in that the flow velocity of the fluid is determined.

16. Device for determining a flow characteristic of a fluid in a conduit, comprising ultrasonic transmission means for providing a predefined timed sequence of a number of ultrasonic burst signals for injection into the fluid, timing means for setting the transmission time of each burst signal of said sequence according to a predefined non-uniform pattern, ultrasonic reception means for receiving a signal, representing said sequence of ultrasonic burst signals, and signal processing means for processing said signal in order to determine the flow characteristic from said signal, wherein the signal processing means comprise means for providing multiple time-shifted copies of the received signal which copies are time shifted according to a predefined relationship with said non-uniform pattern, and for adding the multiple time-shifted copies of the received signal to the received signal, and for reconstructing an original burst signal, and for calculating the flow characteristic using said reconstructed original burst signal.